DOCUMENT RESUME

ED 290 441 IR 012 989

AUTHOR Monahan, Brian; Wimber, Charles
TITLE Distance Learning and Public School Finance.
PUB DATE [87]
NOTE 9p.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Audiotape Cassettes; *Computers; Courseware; *Distance Education; Educational Equity (Finance); *Educational Finance; Educational Vouchers; Electronic Mail; *Equal Education; Microcomputers; Public Schools; Students; Teachers; *Telecommunications; Videotape Cassettes

ABSTRACT

This discussion of the application of computers and telecommunications technology to distance learning begins by describing a workstation equipped to produce "lessonware" in such formats as audiocassettes, videocassettes, diskettes, and voice messages. Such workstations would be located in classrooms equipped with two-way reverse passes to a cable operator's head-in which would be used to upstream lessonware to a PBS (Public Broadcasting Service) station for prerecording. The prerecorded materials would then be broadcast after midnight by the PBS station to be captured by programmable VCRs. Opportunities for interaction with the lessonware could be provided by telephone or a telephone answering device, or by electronic mail using a dedicated bulletin board system. The relationship between distance learning as it is described above and public school finance is then discussed, with emphasis on the issues of equal educational opportunity and taxing equality. It is suggested that the proposed system would work toward geographic equity, and that an inter-public school voucher system financed by a recapture school finance act could help to meet the costs for a technology-based program. It is also suggested that educators must take the initiative in this area or they will be preempted by private and home schooling organizations. A diagram of a self-contained Messageware Workstation is included. (EW)

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Distance Learning and Public School Finance

by

Brian Monahan
Associate Professor of Computer Science
Graduate Program in Educational Computing
Iona College
New Rochelle, NY 10801

(914) 633-2578(W)
(914) 693-0521(H)

and

Charles Wimber
Third Sector User Mentor
3186 S. Stuart St.
Denver, CO 80236
303-936-3269

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Charles Wimber

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

The time to integrate technology into education in the form of distance learning has come. Hundreds of school districts now operate computer bulletin boards for everything from PTA notices to cross-county communication. The April issue of The Computing Teacher was devoted entirely to telecommunications in education.

Affordable Standards

A combination of new technology and new demands upon public education has made distance learning a real possibility. Although the technology is constantly changing, we have reached the point where there are standards on which most school districts can agree. Those standards will make it possible for information to be shared in ways that were never possible before. The "de facto" standards for distance learning include the following:

ASCII TEXT for text messaging

VHS VIDEO for video messaging

DIGITAL AUDIO for audio messaging

TOUCHTONE for voice messaging

As a result, diskettes, videocasettes, audio cassettes and voice messages can be the components of what is called "lessonware." The skills required for the creation of lessonware include the ability to play, record, dub, send, receive and update information created with the integration of voice, audio video and texts. Educators who wish to create lessonware will require a "Desktop Video Production Workstation." (See schematic.) That workstation will be equipped with the following:

- an AM/FM stereo with wireless mike
- a TV/VCR recorder/camcorder/switcher

- a phone with a telephone answer device
- a personal computer system

The personal computer system will have word processing and storage capabilities, a terminal software program, a BBS system and assorted other utility software to improve the quality of the lessonware produced and make that production more efficient. The desktop video production workstation will have the capability of integrating text, images, audio and voice onto a videocassette.

Such workstations, located in classrooms that are equipped with two-way, reverse passes to a cable operator's head-in can upstream lessonware to a PBS where the lessonware can be pre-recorded. After midnight, the PBS can broadcast the lessonware to be captured by programmable VCR'S, either from an over-the-air cable systems or from Direct Satellite. This after midnight technique makes a more efficient use of a PBS's license. Obviously, for true education to take place, mechanisms must exist for responses to the lessonware that is broadcast. Such responses can occur using both voice messaging, either directly by telephone or via a telephone answering device, or through the use of e-mail using a dedicated bulletin board system.

Implications for School Finance

What is the relationship between distance learning, as it is described in this article, and public school finance? Public school finance acts passed by state legislatures and enforced by state departments of education are coming under increased pressure from property tax payers and from students and their parents. In Colorado, for example, the State Board of Education and General

Assembly are facing such pressure from a "class action suit" called Nancy Hafer v. Colorado State Board of Education. The Hafer Case has two sets of plaintiffs: school children and taxpayers. The school children complaints will deal with equal educational opportunity; the taxpayer complaints will deal with taxing equality.

The downstream/upstream distance learning system described in this article is one way to work toward geographic equity in terms of access to educational opportunity. That geographic equity can become a reality because of technology. Of course, start-up costs for a program such as the one described here can be significant. The districts least able to provide a variety of traditional educational opportunities because of their size, demographics or location would be least likely to have the resources to take advantage of the technology described here. A possible solution is an inter-public school voucher system that could be financed by a recapture school finance act. That act would pool property taxes, sales taxes, income taxes and other taxes which go to support education and each district would recapture portions of those taxes based on a combination of weighted needs and student population. (Many state school financing systems already work, at least in part, in this way.)

Distance learning can make inter public school voucher systems affordable, efficient, effective and equitable if the downstream/upstream operating system is standardized and horizontally integrated for voice, audio, video and text messaging. Distance learning has a teacher with students going to

remote study groups electronically with video, audio, e-mail or voice messaging.

The benefits to students go beyond the traditional subject matter that will be covered in the "distance-learning classrooms." PLAY, RECORD, DUB, SEND, RECEIVE, CREATE, AND UPDATE are the absolutes to survive and compete in a world-wide, information-driven, flexible production economy. Students are not the only ones who need these skills to survive. Distance learning can also be used by adults who need to be retrained to participate in an information economy.

An inter-public school system that takes advantage of distance learning will give those teachers who are involved with distance learning a competitive edge. That edge may result in the creation of new types of magnet programs. Traditionally, magnet programs have been special programs that were so attractive that students were willing to travel, sometimes long distances, to participate in them. These programs had to maintain excellence to survive. Magnet programs that apply distance learning provide a way to share excellence with the travel component being eliminated.

"Voucher" is a word with the worst type of connotation for those who support public education. The type of vouchering that should be involved with distance learning will be quite different. If teachers do not lobby for the technology and training to participate, it is possible that they may be bypassed by private and home schooling organizations that do have such access and that can deliver the lessonware more reasonably, especially if they are permitted to do so by using non-certified teachers for all or part

of the lesson production.

Some Examples

Relatively small scale examples of the system being described in this article already exist. In San Antonio, Texas, TI-IN uses a "master-slave, forced-migration" scheme to export lessonware from San Antonio to isolated schools in the rural areas. CompuServe Information Service, through databases like ASK EINSTEIN can assist distance learning. Special SIG's already exist for educators with a variety of interests. More could be formed to offer support for teachers doing distance learning. SIG's could also be formed with specific subject matter focus.

Do we want distance learning to survive and flourish? Our research and experience suggests that we have no choice. For it to succeed in the best possible way, we need a coexistence between public, private and home schooling where there can be peer relationships through on-line activities on the part of teachers, parents, students and even principals and superintendents.

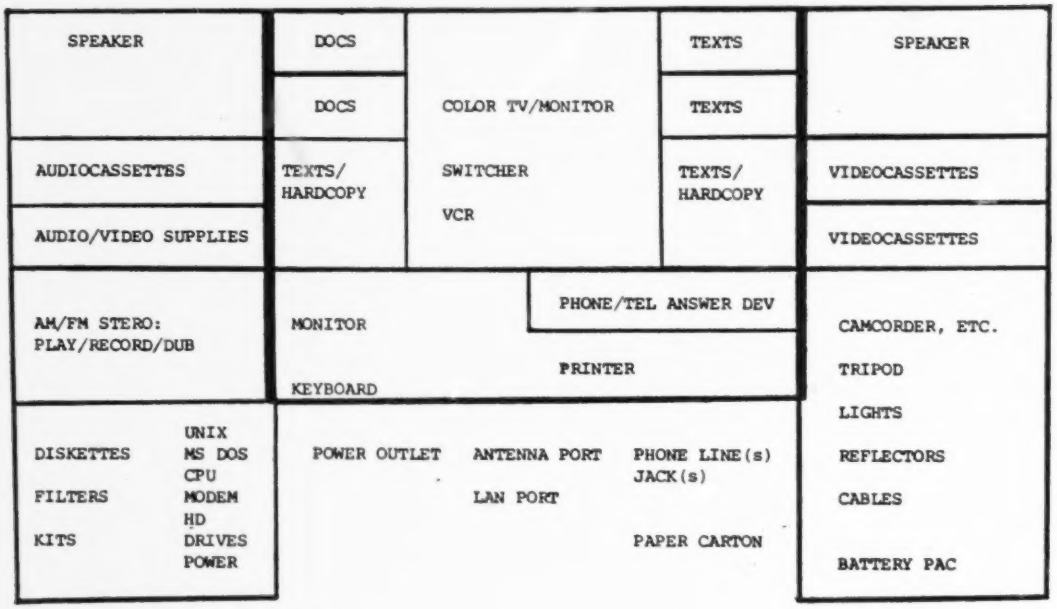
What is the largest industry in the U.S.? -- K-20 education. It is the creativity and innovation of classroom teachers that will determine if our country has the "knowledge-based" work force necessary to compete. With VHS as a video standard, hi-bias as an audio standard, touchtone as a voice standard, and ascii files as a text standard; distance learning can be horizontally integrated. "Play, record, dub, create, send, receive, and update" become absolutes that must be learned by teachers, administrators and their student populations (K-20 students and adults). Professional educators who can direct the production of lessonware

become the "entrepreneurs" that our nation needs in order to compete. Lessonware that is produced by these master teachers for magnet programs can become a shared resource at the local, state and national levels.

The Future of Distance Learning

The process will not end in schools. Lessonware can lead to ECONOWARE for business, HEALTHWARE for doctors and hospitals, SAFETYWARE for police and fire departments, as well as applications for virtually any segment of American life or society. Eventually, the technology can become so widespread that Lessonware becomes "messageware" that adds to creativity and innovation, as well as to the quality of life. Messageware can become "thoughtware" and thoughtware can give America the competitive edge.

SELF-CONTAINED MessageWARE Workstation (that Closes-Up as a Cabinet that is Anchored)



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by Charles Wimber
3186 S. Stuart St.
Denver, CO 80236
303/936-3269